Patent/ public disclosure document
1995213656

[Abstract(made by the applicant)] [Claims] [Detail Description] [Drawing Description]

(57)
[ABSTRACT]

[PURPOSE]
Feeling in impact is improved in head of mold cavity back type.
[CONSTITUTION]
In golf club head pro-iron of typing mold cavity back, of perimeter of head , at a minimum, mild impact absorption materials 40 of relative density was loaded in part - it was buried.

[WHAT IS CLAIMED IS:]

[Claim 1]
When address was done, the sole which lengthens between Citrus auranthium from a heel in the face which is approximately parallel to area, The impact face which lengthens in upper direction from anterior border extending between a heel and Citrus auranthium of this sole, The background face which lengthens in upper direction from posterior margin extending between a heel and Citrus auranthium of this sole, The dimple which is installed in central part of this back face, In golf club head of the iron system which comprised rib installed in circumference of this dimple; Iron system golf club head; wherein; The impact absorption materials that, at a minimum, relative density was mild in part of perimeter of head were put on - it was buried.
[Claim 2]
Iron system golf club head; according to claim 1 wherein; Top of said perimeter was mounted with impact absorption materials - it buried.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[INDUSTRIAL APPLICATION FIELD]
The present invention relates to golf club head of iron system as referred to as so-called mold cavity background that it is from rib installed in circumference of dimple installed in central part of a background face lengthening in upper direction from posterior margin lasting for upper direction between a heel and Citrus auranthium of lengthening impact face and this sole from the anterior border which lasts between a heel and Citrus auranthium of area and the sole which approximately lengthen between Citrus auranthium from a heel in the face which is parallel and this sole when it was done, address and this background face and this dimple.
[0002]

[PRIOR ART]
An iron system golf club as referred to as so-called mold cavity background does a background face of an iron in middle collapse in U.S. Patent No. 3,655,188 description, U.S. Patent No. 4,420,156 description, carbuncle as claimed in Japanese Patent Publication No. 4-65706 bulletin, realization of *waitosuitoeria* by perimeter weight allocation is planned, even if there is a gap of some dot in impact, stabile polarity is had, and ball comes to fly. Mold cavity (cavity) means collapse, a back facet of iron head (back face) is said with back face (back face), the thing which gave this back face bulge like a muscle is referred to as *massurubakku*, the thing which is homogeneity is referred to as plane background in the whole of wall thickness. It is dilute, and, in head of mold cavity back type, board *atsu* of central part of impact side is done, the which did wall thickness of the perimeter thick can plan

perimeter weight allocation. If elevation of rib lengthening in top from wide comb and / or a tray ring edge between a leading edge (bezel of face side lower part) and tray ring edges (bezel of back face lower part) is lifted, if weight is distributed into sole, and *jushinka* plan low, and weight is distributed into Citrus auranthium and sole, moment of inertia becomes massive.
[0003]
It was the thing which it was *rosutowakkusu* formula, and head of conventional mold cavity back type cast the same raw material, a thing, the stainless which, by way of example only, soft iron was forged, and was made, and was made, but, *konpojittokurabu* which made carbon, resin, metal or dissimilar metal compound became make by rule amendment before several years. By way of example only, Perimeter of head is made with heavy berylium kappa of relative density, head of the mold cavity background type which made a central opening engage face materials made with mild titanium of relative density is developed. Because, in such a head, heavy metal is used in perimeter, and central part is mild metal, *waidoka* of *suitoeria* that realization was impossible in head made with raw material such as iron or stainless was enabled. In addition, Because titanium is mild and is strong, thickness of face materials in itself can be made dilute than iron and stainless.
[0004]

[PROBLEM TO BE SOLVED BY THE INVENTION]
Thickness of central part of impact face is dilute in head of conventional mold cavity back type, and, even more particularly, wall thickness becomes particularly dilute in face materials of titanium, and feeling in impact becomes bad. A thing of mold cavity background type as shown in character A was more remarkable in data point five or more 9,14-17 than a thing of *massurubakkutaipu* as shown in character B as shown in FIG. 4, and amplitude was massive as a result that modal analysis did the amplitude in impact in each lay (each data point 1-27) of head shown in FIG. 5 (mm /N).
[0005]
In there, This invention is directed to that the iron system golf club head which improved feeling in impact in head of the mold cavity background type that wall thickness of impact side is dilute is provided.
[0006]

[MEANS TO SOLVE THE PROBLEM]
To achieve the object, this invention, of perimeter of head, mild impact absorption materials of relative density were loaded in part -, at a minimum, it was buried.
[0007]

[OPERATION]
As for the head of conventional mold cavity back type, amplitude in impact is more massive in perimeter than center of impact face of head (data point 4) as shown in character A out of graph of FIG. 4. Therefore, There is the thing which mounted the impact side-centered backside with impact absorption materials (trade name Cleveland <792V AS> iron), and the lay which should control amplitude from graph of FIG. 4 is the perimeter rather than impact face center (suitoeria). This situation became clear. Impact absorption materials are loaded in this division in top of perimeter in particular (9,14,15,16,17,22 FIG. 5, lay) oscillating in impact most or if it is buried, feeling in impact improves.
[0008]

[EXAMPLE]
Drawing is made reference, and, in the following, preferred embodiment of this invention is explained.
[0009]
In the first embodiment shown in FIG. 1, hosel 31 that syzygy is considered to be the lower end of shaft 30 is comprised, when, to the lower end of this hosel 31, address was done, is composed head from dimple 37 installed in central part of background face 36 lengthening in upper direction and this

background face 36 and this rib 38 which it is had hollow, and is installed in 37 circumference by impact face 35 lengthening in upper direction from sole 34 lengthening to 33 ken of Citrus auranthium from heel 32 in area G and the face which are approximately parallel and heel 32 of this sole 34 and anterior border 34A for 33 ken of Citrus auranthium and heel 32 of this sole 34 and 34 posterior margin B for 33 ken of Citrus auranthium. Impact side 35 and back face 36, anterior border 34A and 34 posterior margin B of sole 34 are shown in FIG. 2. It is buried light impact absorption materials 40 of relative density in top of perimeter around *suitoeria* of impact side 35. For purposes of this example, Recess 39 is formed to superior rib 38, impact absorption materials 40 was buried to this recess 39. In addition, It is referred with anterior border 34A of sole 34 leading edge posterior margin 34 B is referred to as a tray ring edge. Bezel of top top line of impact side 35 more is referred to as top edge 41.

[0010]

In FIG. 1 and the first example shown in FIG. 2, impact absorption materials 40 was buried to rib 38 of top edge 41 side, but, impact absorption materials 40 is loaded - rib 38 of rib 38 of rib 38 of 32 heel side and 33 Citrus auranthium side and 34 sole side can bury, too. Even more particularly, Of perimeter of background face 36 of impact face 35 which is next to rib 38 in circumference of *suitoeria* of impact side 35 namely FIG. 1 , at a minimum, impact absorption materials 40 is loaded in part - it may be buried. It is loaded - the backside of impact side 35 which is next to rib 38 along with a point of rib 38 can bury. Perimeter is approximately equivalent to division aside from an area as shown in character 4 in FIG. 5 here. In addition, Impact absorption materials 40 exposes in FIG. 1 outside, but, it is preferable to process back face 36 to cover this impact absorption materials 40.

[0011]

For light impact absorption materials 40 of relative density employed here, high viscoelasticity urethane elastomer can employ in optimum. Goods of brand name of "sorubosein" is marketed for this high viscoelasticity urethane elastomer. This is ether system polyurethane comprising of polyol and MDI which a special device was made on in design phase of molecular structure, and hardness is soft rubber in the range of 0-25 in conventional JIS (A), and it is with 30-70 in *syoa* (00) sclerometer. In addition, Gelatinous material can be used for impact absorption materials 40. By way of example only, The silicon gel which it makes dimethylsiloxane polymer build a bridge by means of chemical condensation mutually, and gave property of silicone rubber and medium of a silicone oil can employ in optimum. Silicon gel for impact cushioning can employ the thing which doped hollow *yu* elastic filler of acrylonitrile / vinylidene chloride copolymerization article in gel of backing material. Relative density is around 0.61 with the thing which doped such a hollow filler. Transformer content is 70-80%, and, by way of example only, with the thing which ring opening polymerization made *noruborunen* synthesized for other impact absorption materials 40 by ethylene and cyclopentadiene, trade name *nosorekkusu* can employ noruborunenporima which had double bond in principal chain in optimum. Rubber-shaped, this *nosorekkusu* is offered. Former silicone gel sticks film such as urethane or PVC on front and back both sides of gel sheet, mold to weld from front and back both sides is pushed , in this state, film of both sides is welded by high frequency, the thing which shut in gel between film can employ. In more addition, For impact absorption materials 40, only application as shown in description is possible at Japanese Patent Laid-Open No. 61-273940 bulletin, too. Less than 25% are preferable, and, as for this, impact resilience of 20 degrees Celsius is equal to or less than 15%, and hardness by bubbling material that 0.05-0.9g / cm ^{3}, is preferable, and bulk density has 0.1-0.7g / cm ^{3} *de* and / or SRIS is equal to or less than 50 degrees, and impact resilience is gelatinous material equal to or less than 25%. Foam rubber or an urethane sponge is nominated for bubbling material , by way of example only, vinylbenzene content 40-75 add vulcanizing agent, vulcanization accelerator to 100 polymer part by weight that it is from gum component other than the vinylbenzene - butadiene interpolymer which is % by weight or vinylbenzene - butadiene interpolymer and 0-40 % by weight of the whole, bulking agent of 30-300 part by weight, plasticizer of 5-100 part by weight, foaming agent of 0.5-60 part by weight, compost comprising of component older than, preferred, the low resilience gum foam which heating bubbling stiffens, and is provided can employ. Weight of impact absorption materials 40 becomes heavy the impact absorption performance which is enough for impact absorption materials 40 is not provided when impact resilience

at 20 degrees Celsius of such a bubbling material exceeds 25% and when bulk density goes over 0.9g/ cm ^{3} *o*, and impact absorption performance and coke strength become insufficient with bulk density 0.05g/ cm ^{3} under.

[0012]

A thing as claimed in when it is done when it was used in iron system golf club head of high viscoelasticity seat mold cavity background type 1993 disclosure utility model summary the 28361st is conventional and known in the art. FIG. 6 of this disclosure utility model summary discloses□@the thing which it was caught in viscoelasticity seat□@having decrement in the range of it is comprised in caliper of impact plate formed flush club face facies anterior bezel 0.1-0.5mm, and very much air temperature 0.4-1.2. Because this viscoelasticity seat extends over the whole rear of impact plate, and there is, resilience to ball by impact plate is assembling it might be failed and cannot but employ viscoelasticity seat in excess. Impact absorption materials 40 is loaded in perimeter than center of impact side 35 from graph of FIG. 5 - though buried controls jolt as had described first, it is useful. In addition, In addition, if superior wall thickness of head is ground thick without employing impact absorption materials 40, jolt of head top can be controlled. However, When wall thickness of head top is ground thick, center of gravity becomes high, and there is not function of center of gravity low. In addition, If merely head superior wall thickness was made thick, total amount of head weight increases, balance is done badly. Therefore, Advantage of mold cavity back type is kept alive, and to improve feeling in impact without changing gross weight of head weight, of perimeter of head , at a minimum, mild impact absorption materials 40 of relative density is loaded in part - it had better be buried.

[0013]

The second embodiment shown in FIG. 3 forms hosel 31 and head body region 42 from heavy material of relative density, iron system golf club head installing face materials 44 by measure of intercuspation is shown in opening 43 opened to head body department 42. Flange 45 for face materials 44 to abut in perimeter of opening 43 opened to head body 42 is formed, is mounted this flange 45 with impact absorption materials 40. Face materials 44 is formed by material such as mild raw material, titanium of relative density, for example. Hosel 31 and head body 42 employed berylium kappa. In this the second embodiment, all circumference of flange joint 45 which surrounded opening 43 was mounted with impact absorption materials 40, but, it can be loaded for division. In addition, There is not insertion, and may bury impact absorption materials 40 to rib 38 which is next to top edge 41, of course.

[0014]

FIG. 4 is a thing to show amplitude in each data point of head shown in FIG. 5 (mm /N) in, and graph as shown in character A is iron system golf club head of mold cavity background type of general, and a thing as shown in character B is iron system golf club head of *massurubakkutaipu*, and graph as shown in character C shows the thing which put impact absorption materials 40 on each data point shown in FIG. 5 of head of embodiment of this invention namely mold cavity background type. In addition, The next bill shows decrement of amplitude when impact absorption materials 40 was put on each FIG. 5 point.

[0015]

[TABLE 1]

測定点	2	4	5	6	8	9	14
振幅減少率	64.4	16.0	24.5	35.2	16.4	34.3	34.8
測定点	15	16	17	18	22	23	平均
振幅減少率	16.2	38.8	47.6	31.9	43.6	42.3	34.3

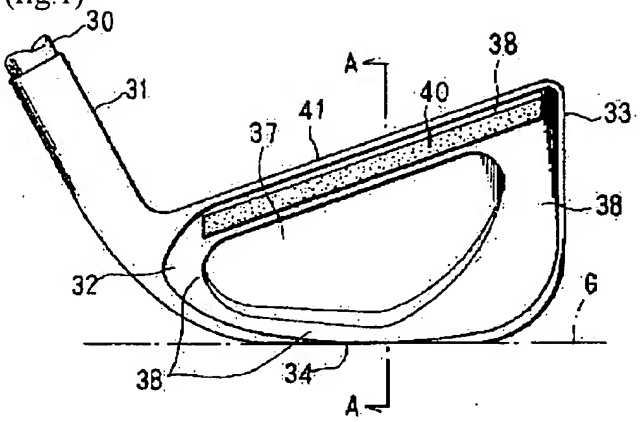
[0016]
As is apparent from graph shown in FIG. 4 and the list, jolt can be controlled mild impact absorption materials 40 of relative density is loaded in perimeter around a center of head namely central part including *suitoeria* of impact face 35 - when it was buried, impact absorption materials 40 was loaded in 9,14,15,16,17,22 lay shown in FIG. 5 particularly - when it was buried, that effect is massive is understood. Even if impact absorption materials 40 is added to head top, it is compared to do wall thickness of head top thick, and there is little alteration of weight. In other words, Because relative density of impact absorption materials 40 is mild, it is extremely small to give center of gravity lay, balance of a club effect, and prominent effect is played in feeling improvement in impact.
[0017]

[EFFECT OF THE INVENTION]
As discussed above, According to this invention, the effect which it is compared with the thing which sticks impact absorption materials on the whole rear of impact face in what, at a minimum, there is not insertion, and buried mild impact absorption materials of relative density in part of perimeter of head in iron system golf club head of mold cavity back, and material is reduced, and control jolt is high. In addition, Because it is light impact absorption materials of relative density, adverse effect needs not to be given center of gravity lay of head and balance of a club by insertion of impact absorption materials - undergrounding. In addition, Feeling in impact improves impact absorption materials in perimeter by burying, character of a mold cavity iron needs not to be harmed.

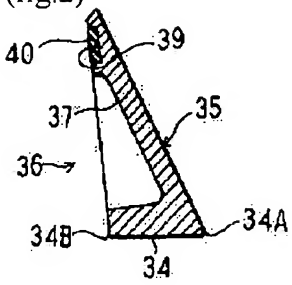
[BRIEF DESCRIPTION OF DRAWINGS]

[FIG. 1]
It is figure watched from back face showing the first embodiment of this invention.
[FIG. 2]
It is A-A line cross section of FIG. 1.
[FIG. 3]
It is a partly sectional exploded perspective view to show the second embodiment of this invention.
[FIG. 4]
The graph which compares amplitude in impact in each data point of head.
[FIG. 5]
It is figure showing data point in modal analysis of head.
[DENOTATION OF REFERENCE NUMERALS]
32 A heel 33 Citrus auranthium 34 Sole 35 Impact side 36 Back face 37 Dimple 38 Rib 40 Impact absorption materials

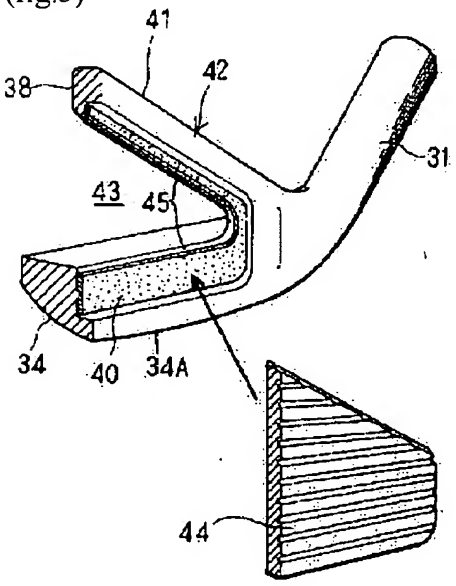
(fig.1)



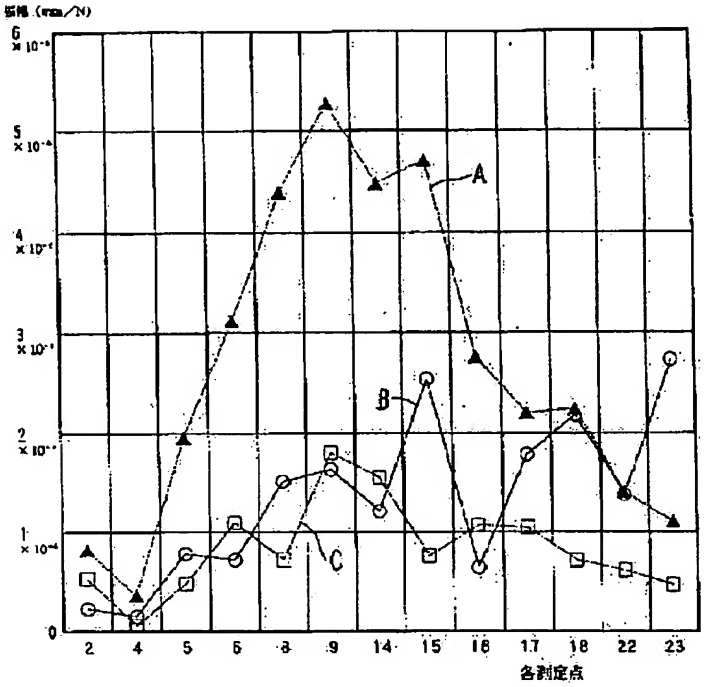
(fig.2)



(fig.3)



(fig.4)


A
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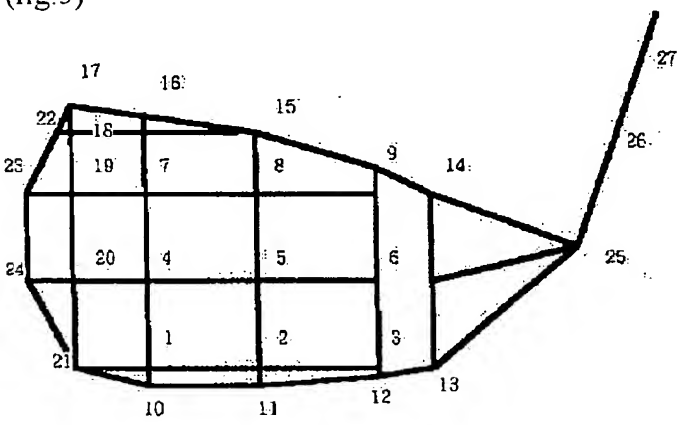
各測定点

(fig.5)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